

Lucky Horseshoes

Assateague Island National
Seashore
National Park Service
U.S. Department of the Interior



A Good Luck Charm?

Do you have a "good luck charm"? Many of us have some object that we believe brings us good luck. Perhaps you have a four-leaf clover pressed between book pages, carry a rabbit's foot or have a horse shoe hung over a doorway. What kind of good fortune has it brought you? Japanese fishermen believe it is a good omen to harvest a pair of horseshoe crabs from their first netting of the season. Have you ever thought of the Horseshoe Crab as your "good luck charm"? You might be surprised to discover that this curious creature has brought many (and maybe even you!) good luck through health, wealth and happiness!

Luck of the Draw

In the early 1950s, scientists made a rather interesting observation. They noticed that when a horseshoe crab was injured, almost immediately a bluish, jelly-like substance formed at the wound. What they saw was similar to the clotting reaction that happens when people are injured. As a survival adaptation to living in the ocean environment, a horseshoe crab's blood will quickly form a protective barrier, preventing bacteria from entering its blood stream and making it ill. Coastal sea water that horseshoe crabs live in might be considered a "bacteria soup." In just the amount of water you can cup in your hand, over 500,000 billion bacteria can be found!

From that chance observation, it was discovered that a solution made from horseshoe crab blood could be used to test the sterility of any needles, surgical equipment or fluids that were going to be introduced into the human body. This new process was much faster, more accurate and less expensive than procedures that had been used in the past.

Today, special laboratories contract boats to collect horseshoe crabs for the healthcare

industry. The crabs are placed upside down in a rack, a needle is inserted into a large joint, and a small amount of blood is drawn. This "donation" does not typically harm the crabs, who are returned to the ocean the following day.



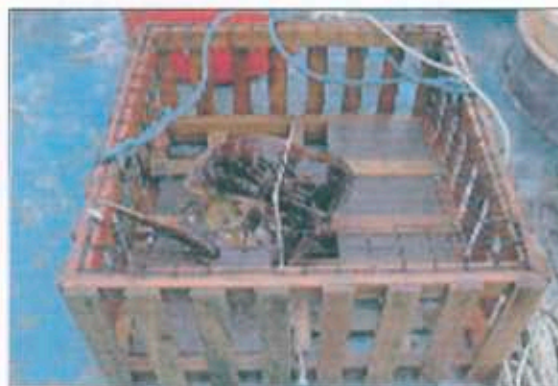
Laboratory conditions must be completely sterile so the collected blood does not become contaminated and destroyed by bacteria.

If you have ever received an immunization, stitches or surgical implant, you were fortunate to have benefitted from the amazing blood of the horseshoe crab! Horseshoe crab blood is also being used in cancer, leukemia and meningitis research. Who knows what type of luck the horseshoe crab might bring to your future health?

Pot Luck

Some say it is "better to be healthy than wealthy." However, we all also understand the ever-present need to pay the bills and feed our families. Can you imagine simply finding dollars lying on the beach or sunken treasure at the bottom of the ocean? Could you be that lucky?

It is not *that* easy for east coast watermen, but some have been able to take advantage of the bounty of bait that comes from the horseshoe crabs' yearly spawning migration. Each year millions of crabs are hand harvested from sandy beaches where the crabs come to spawn and are dredged from the ocean bottom. Watermen that fish for whelks and eels use the crabs to bait their "pots" or traps. In 1996, the commercial harvest of horseshoe crabs was estimated to be a \$1.5 million dollar industry.



An entire male crab is used for bait in this whelk pot. Egg-laden females, typically chopped in half, are believed to make the best bait.

"Lucky in Love"



Shorebirds crowd the most desirable horseshoe crab spawning beaches to gorge themselves on horseshoe crab eggs.

It might be a stretch to say that horseshoe crabs have a "love life", but their yearly mating ritual has certainly endeared them to wildlife enthusiasts and birders around the world. Millions of horseshoe crabs come ashore each spring to start the next

generation of crabs, which in itself is an awe inspiring spectacle. In addition to being able to witness and appreciate this spawning ritual, we also have the opportunity to enjoy the eleven species of shorebirds that time their northerly migration with the horseshoe crabs' reproductive cycle. The billions of green, b-b sized eggs that are deposited along the shoreline of protected sandy beaches provide an irreplaceable source of fuel for these long- distance travelers who fly from South America to the Arctic tundra. Without that rich and abundant supply of protein, birds such as the red knot would not have the energy to make it to their nesting grounds to start their generation of offspring. Although not especially fortunate for the horseshoe crab eggs, this bountiful buffet is incredibly important and "lucky" for the birds, which enables *them* to survive, breed and be "lucky in love", as well.

Will Their Luck Run Out?

Horseshoe crabs have been on the earth since the age of the dinosaur. They have seen the birth and death of glaciers, the rise and fall of human dynasties, and the flourish or disappearance of thousands of other species of life. They are uniquely adapted to their way of life, but they are also facing a multitude of challenges. Is their luck running out?

Harvesting horseshoe crabs for whelk and eel bait has had a notable impact on the population, as millions of crabs are chopped up and placed in pots each year. There is, however, research being done on artificial baits that might effectively replace the use of horseshoe crabs. In addition, the use of bait bags has helped to reduce the need for the crabs as bait by as much as 50 percent.

Traditionally, mountains of horseshoe crabs were harvested annually for the purpose of drying and pulverizing them for crop fertilizer. This practice is now almost a thing of the past due to factory produced substitutes, however, we may have unknowingly impacted the species as a whole. We have learned that horseshoe crabs do not reach maturity and cannot spawn until they are at least ten to eleven years old. It will likely take a long time for the declining horseshoe crab population to recover, since the large, reproducing adults were the most desirable for this type of use.



The odor caused by mountainous millions of decaying horseshoe crabs angered residents that came to resent nearby fertilizer factories

However, of all the challenges to survival that people pose to the horseshoe crab, there is one that might be the most devastating of all. Horseshoe crabs must have calm, clean, protected, sandy beaches on which to lay their eggs. These types of beaches are also extremely attractive to those of us that have dreams of owning picturesque beach houses. Eventually, this type of development is typically threatened by erosion, which in turn, frequently results in the construction of sea walls of wood or concrete "rip-rap". These sea walls either prevent the horseshoe crabs from coming ashore to lay their eggs or trap them, where they die of exposure.



Countless horseshoe crabs die of exposure when trapped in shoreline stabilization features. Here, young girls are working to free horseshoe crabs caught in concrete rip-rap.

Have you ever thought of *yourself* as a good luck charm? With new technologies watermen have the *choice* to use artificial baits and bait bags to help both themselves and the horseshoe crab. With some not- so- new technology, farmers have the *choice* to use other fertilizers (if needed at all) rather than using ground up horseshoe crabs. Finally, as humans, we have the *choice* of where and how we build our homes. Horseshoe crabs cannot choose to lay their eggs anywhere but on a calm, clean, sandy beach. We can make choices that help the horseshoe crab. Is it possible that this ancient creature's luck might finally run out? Or, is it possible that in some way you might be the horseshoe crab's good luck charm through the choices you make?

For additional information on horseshoe crabs, go to:

- <http://www.ocean.udel.edu/horseshoecrab/>
- <http://www.horseshoecrab.org/>
- <http://www.k12.de.us/warner/hscindex.html>